FEDERAL-STATE

COOPERATIVE SNOW SURVEYS and IRRIGATION WATER FORECASTS

for

RIO GRANDE DRAINAGE BASIN

May 1, 1949

by

Division of Irrigation, Soil Conservation Service
United States Department of Agriculture
and
Colorado Agricultural Experiment Station

Data included in this report were obtained by the Snowfall Survey Party in cooperation with the U.S. Forest Service, National Park Service, State Engineers of Colorado and New Mexico and other Federal, State, and local organizations.

MAY 1, 1949

Water Supply Outlook

RIO GRANDE RIVER DRAINAGE BASINS

The water supply outlook for the irrigated areas served by the Rio Grande and its tributaries in the San Luis Valley is well above normal. During the month of April precipitation was very low in the high mountains areas and a considerable amount of snow melt occurred at low and medium elevations. For streams originating in the mountains to the east of the Valley summer flow is expected to be slightly less than normal, Recent Valley precipitation has been deficient. On the head waters of the Chama the water supply outlook has declined slightly but the summer flow is expected to be well above average and similar to a year ago. On other New Mexico tributaries the summer flow should be near normal.

RIO GRANDE

Snow accumulation along the Continental Divide to the west of the San Luis Valley is still very high even though the April snow accumulation was lessthan normal and the melting at low and medium elevations unusually high. The total runoff on the Rio Grande at Del Norte is expected to be slightly less than for the 1948 season. For the Alamosa and Conejos Rivers the 1949 summer flow will likely exceed that for 1948. Because of the loss in snow at medium elevations, peak flows are expected to be somewhat less than for last season. Reservoir storage in San Luis Valley is down considerably from a year ago. Soil moisture conditions are described as good.

On the head waters of the Rio Chama estimated summer flow has also declined since April 1 snow surveys were made. The flow of the Rio Chama at Park View is expected to be about 350,000 acre-feet for the April-Sept., 1949 period. The expected peak flow into the reservoir has also declined substantially since April 1. Storage in El Vado Reservoir was 105,000 acre-feet on May 1. For the Rio Grande at Otowi Bridge the April-Sept. flow is estimated at about 1,200,000 acre-feet. Due to an unusually heavy loss in snow cover in northern New Mexico and especially on the Upper Rio Grande, the expected peak flow of the Rio Grande is down substantially from April 1. However, it is probable that the peak flow will exceed that for 1948.

The summer flow on the other tributaries to the Rio Grande in northern New Mexico is expected to range from normal to considerably below normal. Soil moisture conditions in this area are reported as good eventhough precipitation during the last two weeks of April was decidedly deficient.

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The combined storage in Elephant Butte and Caballo Reservoirs is now 627,000 acre-feet as compared to 565,000 on May 1, 1948. There should be a substantial increase in storage this season. Precipitation in the lower Rio Grande Valley has been deficient but crop conditions are reported as good.

On the Carlsbad Project on the Pecos River the water supply outlook is rather poor. Stream flow and precipitation have been sub-normal and the soil moisture is dry. Storage in Alamogordo and McMillan Reservoirs total about 14,000 acre-feet which is a little better than last year but only about 25 percent of normal.

CANADIAN RIVER

On the headwaters of the Canadian River the snow is practically gone and summer discharge of the streams is expected to be less than average. On the Tucumcari Project precipitation has been above normal and soil moisture and crop conditions are reported as very good.

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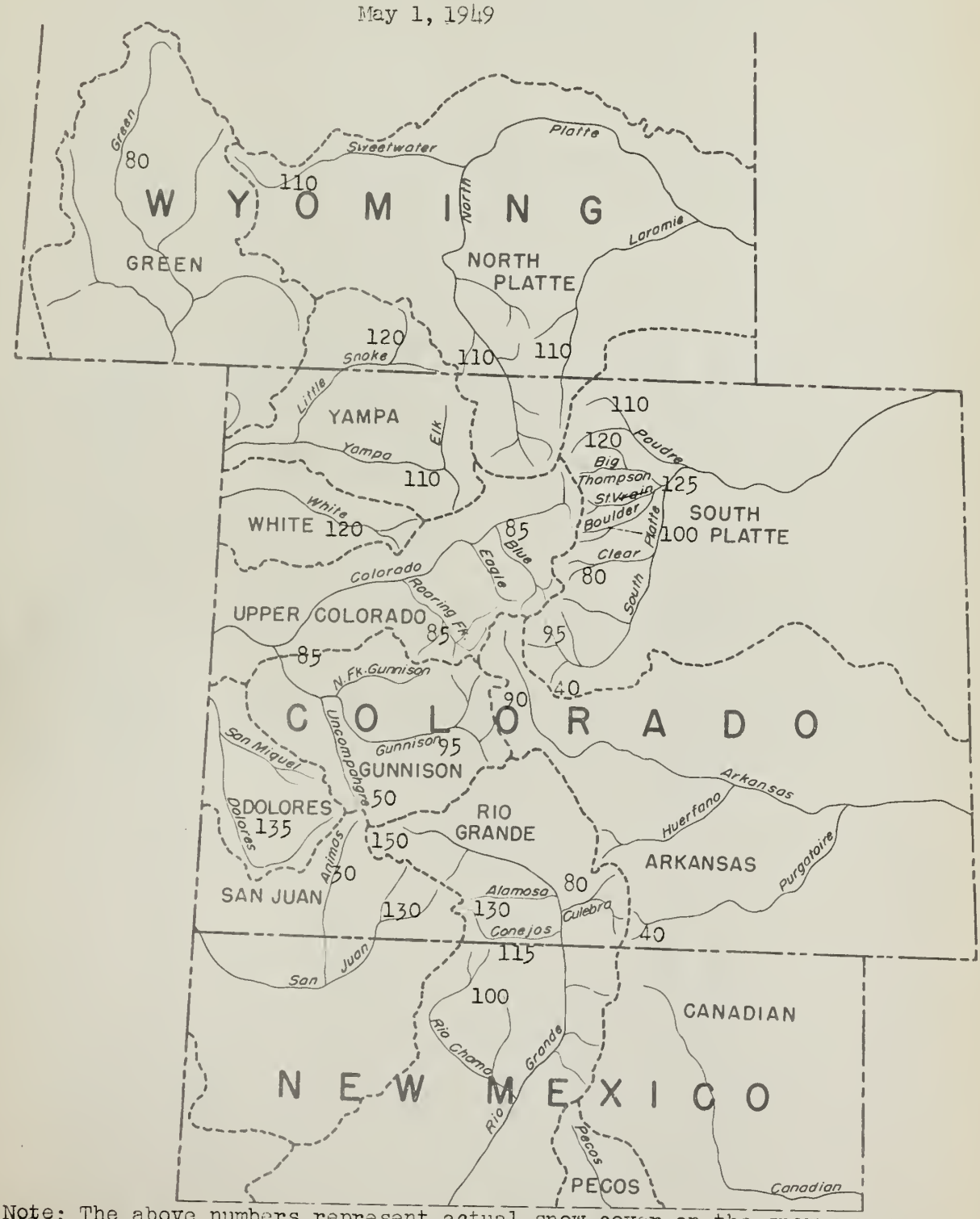
The Ground Water Division, U. S. Geological Survey at Albuquerque, New Mexico reported as follows regarding ground-water levels in New Mexico: "As a result of the beginning of the irrigation season, ground-water levels began falling during April in most areas in New Mexico where ground water is used for irrigation. However, the amount of decline was generally less than occurred during the same month of 1948 because of the reduction in spring pumping which was the result of the favorable soil moisture that was built up during the above normal precipitation during January. The net annual declinesin water levels are generally less than last year and in the artesian well "Berrendo" near Roswell amounted to 0.9 foot this year as compared with 3.2 feet last year. These smaller declines may be the result in part of the excess precipitation that fell during January. However, the reduction in spring pumping probably is mainly responsible."

WATER CONTENT OF SNOW ON THE WATERSHEDS OF
PLATTE, ARKANSAS, UPPER COLORADO AND RIO GRANDE BASINS
BASED ON SNOW SURVEYS MADE APPROXIMATELY FIRST DAY OF MONTH

In Percent of Normal
May 1, 1949



Note: The above numbers represent actual snow cover on the snow courses on the watershed in percent of normal as of May 1, 1949. These numbers do not necessarily coincide with expected summer runoff.

RIO GRANDE DRAINAGE BASIN

STREAM FLOW FORECASTS, May 1, 1949

Basin and Stream	April-September, inclusive, Streamflow Acre Feet				
	Forecast 1949	Measured Runoff 1948	1947	1946	10-year Avg. 1938-1947
RIO GRANDE					
South Fork at South Fork	175,000		104,000	132,000	129,000
Rio Grande at Del Norte	800,000	823,000	530,000	347,000	553,000
Alamosa above Terrace Res.	110,000		68,000	40,000	76,000
Conejos at Mogote	300,000	262,000	176,000	124,000	214,000
Culebra at San Luis	35,000		43,000	16,000	39,000
Chama at Park View	350,000		148,000	79,000	233,000
Taos at Los Cordovas	25,000		21,000	5,000	44,000
Embudo Creek at Dixon	65,000		27,000	18,000	60,000
Rio Grande at Otowi Bridge	1,200,000	987,000	422,000	204,000	872,000
Rio Grande at San Marcial	1,000,000	727,000	180,000	58,000	691,000
Pecos at Pecos	60,000		38,000	25,000	67,000

SNOW SURVEYS AND IRRIGATION WATER FORECASTS
RIO GRANDE BASIN

STATUS OF RESERVOIR STORAGE, May 1, 1949

STREAM	RESERVOIR	USABLE CAPACITY 1000 A.F.	THOUSANDS OF ACRE FEET IN STORAGE About May 1 1949	1948	1947	1946	10-year Ave. 1938-47
RIO GRANDE							
	Rio Grande	51.1	21.2	30.5	6.9	1.9	16.8
	Santa Maria	43.5	17.3	7.5	5.5	6.7	11.2
	Sanchez	103.0	8.9	12.0	7.4	9.1	18.0
	Terrace	17.7	2.5	10.7	2.4	2.4	4.7
	Continental	26.7	--	8.9	1.2	15.1	8.3
	Elephant Butte	2273.7	508.3	408.6	450.0	964.7	1133.7
	Caballo	365.0	149.4	151.9	207.3	199.5	146.6
CHAMA RIVER	El Vado	198.0	115.0	98.0	84.1	151.1	121.0
CANADIAN RIVER							
	Conchas	600.0	300.6	371.0	358.7	333.5	270.6
PECOS RIVER							
	Alamogordo	148.0	11.4	1.5	23.2	4.4	50.3
	McMillan-Avalon	45.1	3.9	5.5	4.6	4.0	16.3

SNOW SURVEYS AND IRRIGATION WATER FORECASTS
for
RIO GRANDE BASIN
May 1, 1949

SUMMARY OF MAY 1 SNOW SURVEYS AND COMPARISON OF DATA WITH THAT OF PREVIOUS YEARS BY WATERSHEDS

WATERSHEDS	Snow Depth			Water Content			Number Courses in Average	Snow Density			1949 Water Content in percent of	
	Twelve year Avg.*	1948	1949	Twelve year Avg.*	1948	1949		Twelve year Avg.	1948	1949	Twelve Year Avg.*	1948
	In.	In.	In.	In.	In.	In.		Percent	Percent	Percent		
Rio Grande (Colo.)	17.8	18.0	19.0	7.4	7.7	8.5	9	41	43	45	115	110
Upper Rio Grande	23.4	27.7	31.3	10.1	12.9	15.4	3	43	47	49	152	119
Alamosa River	34.1	--	39.3	11.8	--	15.4	2	35	--	39	130	---
Conejos River	36.4	--	39.7	14.3	--	16.3	3	39	--	41	114	---
Culebra River	28.5	24.0	25.4	10.2	9.0	8.2	1	36	37	32	80	91

*Some for shorter periods

PRECIPITATION DATA

WATERSHED	STATE	Precipitation October 1 to April 30	Departure from Normal	Precipitation* April	Departure from Normal
		Inches	Inches	Inches	Inches
Canadian	New Mexico	5.77	+0.04	1.35	+0.13
Rio Grande	Colorado	3.51	-0.80	0.72	-0.01
Rio Grande (N)	New Mexico	7.84	-0.20	1.60	+0.24
Rio Grande (S)	New Mexico	3.24	-0.59	0.36	-0.14
Pecos	New Mexico	5.53	+0.15	1.20	+0.22

*April precipitation tentative

RIO GRANDE DRAINAGE SNOW SURVEYS
May 1, 1949

Drainage Basin and Snow Course	Location: No. and State	Sec.	Twp.	Range	Elev.	Snow Cover Measurements: Date of Survey	Snow Depth (Inches)	Water Content (Inches) 1949	1948	1947	Past Record: Yrs. of Rec.	Av. Water Content (Inches)
RIO GRANDE IN COLORADO												
Wolf Creek Pass	26 Colo	4	37N	2E	10000	4/28	77.7	39.5	36.0	17.5	13	26.8
Upper Rio Grande	27 "	13	40N	4W	9350	4/29	16.2	6.8	2.7	0.0	13	2.1
Silver Lakes	47 "	15	36N	5E	9600	4/30	2.4	0.8	0.4	0.0	12	1.1
River Springs	49 "	25	33N	6E	9300	4/30	0.8	0.3	0.5	0.0	12	1.2
LaVeta Pass #2	74 "	22	28S	70W	9300	4/29	6.0	2.0	3.1	5.0	13	4.2
Summitville	76 "	30	37N	4E	11500	4/28	76.2	30.0	---	20.7	10	22.5
Cumbres Pass #2	77 "	17	32N	5E	10000	4/30	42.2	18.7	17.3	8.7	13	19.1
Santa Maria	80 "	8	41N	2W	9700	4/30	0.0	0.0	0.0	0.0	10	1.4
Culebra	82 "		37.2N	105.2W	10000	4/30	25.4	8.2	9.0	10.5	9	10.2
Ft. Garland	84 "	13	29N	72W	8200	5/1	0.0	0.0	0.0	0.0	7	0.9
Stunner Pass	107 "	16	36N	4W	10550							
Platoro	108 "	22	36N	4W	9950	5/1	39.2	18.5				
West Conejos	109 "	25	35N	4E	9450	5/1	1.0	0.3				
La Manga	110 "	24	32N	5E	10100	4/28	41.9	20.2				
Pyramid	112 "	26	41N	5W	10300	4/30	22.5	9.1				
Spr. Creek Pass	123 "	2	42N	3W	10900	4/30	26.9	10.8				
Pool Table Mt.	124 "	19	41N	2E	10000	4/28	15.5	5.5				
Lake Humphreys	125 "	32	40N	1E	9300	4/29	2.2	0.9				
Cochetopa Pass	126 "	12	45N	3E	10000	5/2	11.1	4.1				
		Average for drainage					19.0	8.5	7.7	4.6		7.4
UPPER RIO GRANDE												
Wolf Creek Pass	26 Colo.	4	37N	2E	10000	4/28	77.7	39.5	36.0	17.5	13	26.8
Upper Rio Grande	27 "	13	40N	4W	9350	4/29	16.2	6.8	2.7	0.0	13	2.1
Santa Maria	80 "	8	41N	2E	9700	4/30	0.0	0.0	0.0	0.0	10	1.4
Pyramid	122 "	26	41N	5W	10300	4/30	22.5	9.1				
Spr. Creek Pass	123 "	2	42N	3W	10900	4/30	26.9	10.8				
Pool Table Mt.	124 "	19	41N	2E	10000	4/28	15.5	5.5				
Lake Humphreys	125 "	32	40N	1E	9300	4/29	2.2	0.9				
		Average for drainage					31.3	15.4	12.9	5.8		10.1

RIO GRANDE DRAINAGE SNOW SURVEYS
May 1, 1949

Drainage Basin and Snow Course	Location: No. and State	Sec.	Twp. or Lat.	Range or Long.	Elev.	Snow Cover Measurements: Date of Survey	Snow Depth (Inches)	Water Content (Inches) 1949	1948	1947	Past Record: Yrs. of Rec.	Av. Water Content (Inches)
ALAMOSA RIVER												
Silver Lakes	47 Colo.	15	36N	5E	9600	4/30	2.4	0.8	0.4	0.0	12	1.1
Summitville	76 "	30	37N	4E	11500	4/28	76.2	30.0	--	20.7	10	22.5
			Average for drainage				39.3	15.4		10.3		11.8
CONEJOS RIVER												
River Springs	49 Colo.	25	33N	6E	9300	4/30	0.8	0.3	0.5	0.0	12	1.2
Summitville*	76 "	30	37N	4E	11500	4/28	76.2	30.0	--	20.7	10	22.5
Cumbres Pass*#2	77 "	17	32N	5E	10000	4/30	42.2	18.7	17.3	8.7	13	19.1
Platoro	108 "	22	36N	4W	9950	5/1	39.2	18.5				
West Conejos	109 "	25	35N	4E	9450	5/1	1.0	0.3				
La Manga	110 "	24	32N	5E	10100	4/28	41.9	20.2				
			Average for drainage				39.7	16.3		9.8		14.3
CULEBRA RIVER												
Culebra	82 Colo.		37.2N	105.2W	10000	4/30	25.4	8.2	9.0	9.3	9	10.2
RIO GRANDE IN NEW MEXICO												
CHAMA RIVER												
Cumbres Pass #2	77 Colo.	17	32N	5E	10000	4/30	42.2	18.7	17.3	8.7	13	19.1
Canjilon	6 N.M.	4	26N	6E	9500	5/1	30.0	15.7	--	--		
Pay Role	15 "	16	28N	7E	9700	4/29	14.2	6.2	--	--		
Chama Divide	17 "		36.9N	106.7W	7750	4/29	0.0	0.0	--	--		
Chamita	18 "		36.9N	106.7W	8500	4/29	2.4	1.3	--	--		

*On adjacent drainage

The following organizations cooperate in the road surveys and irrigation water supply research for the Colorado, Gunnison-Arkansas and Rio Grande watersheds of Colorado, Wyoming and New Mexico.

State

- Colorado State University
  - Colorado State University
  - Fort Collins, Colorado
  - New Mexico State University
  - Southern Colorado State College
  - Pueblo, Colorado
  - Colorado Experiment Station
  - Colorado Experiment Station
  - Fort Collins, Colorado
  - Southern Colorado Experiment Station
  - Pueblo, Colorado

Federal

- Department of Agriculture
  - Agricultural Research Service
  - Soil Conservation Service
- Department of Interior
  - Bureau of Reclamation
  - Denver, Colorado
  - Bureau of Land Management
  - Denver, Colorado
- Department of Commerce
  - Weather Bureau
- War Department
  - Army Corps of Engineers
  - Denver, Colorado

Utilities

- Colorado Public Service Company
- Southern Colorado Power Company
- Western Power Company
- Public Service Company of New Mexico
- Kansas and New Mexico Power Company of Rio Grande

Municipalities

- City of Alamosa
- City of Monte Vista
- City of Saguache

Water Conservancy Districts

- Pueblo Valley Water Users Association
- Arkansas Valley Water Association
- Colorado River Water Conservation District

Canal or Ditch Companies

- Farmers Reservoir and Irrigation Company
- San Luis Valley Irrigation District
- Rio Grande Irrigation Company
- Powell Ditch Company
- Saguache Valley Water Users Association
- Dragon Development Company
- Conejos Irrigation District
- Kowalski Company
- Pueblo Irrigation District
- Bell Ditch Valley Water Users Association
- San Luis Irrigation and Drainage District
- Rio Grande Canal Co. and Canal Company

Many other organizations and individuals furnished valuable information for the road survey reports. Their cooperation is gratefully acknowledged.